AMENDMENT NO. 2 JULY 2018
TO
IS 6911 : 2017 STAINLESS STEEL PLATE, SHEET AND STRIP — SPECIFICATION

(Second Revision)

(*Page* 2, *clause* **9.2**, *para* 1, *line* 6) — Substitute 'Brinell or Rockwell or Vickers' *for* 'Brinell or Rockwell'.

(*Page* 2, *clause* **9.2**, *para* 2, *line* 4) — Substitute '5 HRB or 30 HBS/HBW or 30 HV' *for* '5 HRB or 30 HBS/HBW'.

[*Page* 3, *Table* 1 (*see also Amendment No*. 1)] — Substitute the existing table with the Table 1 on page 2 of this Amendment.

(*Page* 5, *Table* 2) — Substitute the existing table with the Table 2 on page 8 of this Amendment.

(*Page* 6, *Table* 3) — Substitute the existing table with the Table 3 on page 10 of this Amendment.

(*Page* 7, *clause* **10.2**) — Substitute the following for the existing clause:

'10.2 Hardness Test

The hardness test shall be performed by any one of the methods of IS 1500 (Part 1), IS 1501 (Part 1) and IS 1586 (Part 1).'

[*Page* 8, *Table* 4 (*see also Amendment No*. 1)] — Substitute the existing table with the Table 4 on page 17 of this Amendment.

Price Group 7

Table 1 Chemical Composition, Percent 1)
(*Clauses* 7.1 *and* 7.2)

Sl No. (1)	Grade Designation Letter Sumbol [*see* IS 1762 (Part 1)] (2)	Numerical Symbol ISS (3)	C *Max* (4)	Si *Max* (5)	Mn *Max* (6)	Ni *Max* (7)	Cr (8)	Mo (9)	S *Max* (10)	P *Max* (11)	N *Max* (12)	Cu *Max* (13)	Others (14)
i)	*Ferritic steels:*												
1	X 04Cr12Al	405	0.08	1.00	1.00	0.60	11.5-14.5	—	0.030	0.040	—	—	Al 0.10-0.30
2	X 02Cr12Ti	409	0.030	1.00	1.00	0.50	10.5–11.7	—	0.020	0.040	0.030	—	Ti 6x (C+N) *Min*; 0.50 *Max;* Nb 0.17 *Max*
3	X 02Cr12	409 M	0.030	1.00	0.50-1.50	1.50	10.5-12.5	—	0.030	0.040	—	—	—
4	X02Cr12Ti	409Ti1	0.030	1.00	1.00	0.50	10.5-11.7	—	0.020	0.040	0.030	—	Ti 8x(C+N) *Min,* Ti 0.15-0.50; Nb 0.10
5	X02Cr12TiNb	409Ti2	0.030	1.00	1.00	0.50	10.5-11.7	—	0.020	0.040	0.030	—	(Ti+Nb) [0.08+8x(C+N)] min, 0.75 *Max*; Ti0.05 *Min*
6	X02Cr12Ni1Ti	409Ti3	0.030	1.00	1.00	0.50-1.00	10.5-11.7	—	0.030	0.040	0.030	—	Ti 6x(C+N) *Min*, 0.75 *Max*
7	X05Cr12Ti	409Ti4	0.08	1.00	1.00	0.60	10.50-11.75	—	0.030	0.040	—	—	Ti (6×C) -0.75
8	X02Cr12Ti	409Ti5	0.030	1.00	1.00	0.60	10.5-11.75	—	0.030	0.040	—	—	Ti (6×C) -0.75
9	X 04Cr12	410 S	0.08	1.00	1.00	0.60	11.5–13.5	—	0.030	0.040	—	—	—
10	X02Cr13Nb	410S1	0.030	1.00	1.00	0.50	12.0-13.0	—	0.030	0.040	0.030	—	Nb 9x(C+N) *Min,* 0.60 *Max*
11	X02Cr12Ni1	410S2	0.04	1.00	1.00	0.60-1.10	10.5-12.5	—	0.030	0.045	0.10	—	—
12	X05Cr14Ni2Mo1Ti	410S3	0.08	1.00	1.00	1.0-2.5	13.5-15.5	0.2-1.2	0.030	0.045	—	—	Ti 0.30-0.50
13	X10Cr15	429	0.12	1.00	1.00	—	14.0-16.0	—	0.030	0.040	—	—	—
14	X01Cr15Nb	429Nb	0.020	1.00	1.00	—	14.0-16.0	—	0.015	0.025	0.02	—	Nb 0.20-0.6
15	X 07Cr17	430	0.12	1.00	1.00	0.75	16.0-18.0	—	0.030	0.040	—	—	—
16	X02Cr17TiNb	430Ti	0.030	0.75	1.00	—	16.00-19.00	—	0.030	0.040	—	—	Ti or Nb 0.10-1.00
17	X02Cr17CuTiNbZr	430Ti1	0.025	1.00	1.00	—	16.00-20.00	—	0.030	0.040	0.025	0.30-0.80	Ti,Nb,Zr or combination thereof 8(C + N) to 0.80,
18	X08Cr17Mo1	434	0.12	1.00	1.00	—	16.0-18.0	0.75-1.25	0.030	0.040	—	—	—
19	X02Cr17Mo1Nb	436	0.12	1.00	1.00	—	16.0-18.0	0.75-1.25	0.030	0.040	—	—	Nb 5xC*Min*, 0.80 *Max*
20	X02Cr17Mo2TiNbZr	436L	0.025	1.00	1.00	—	16.00-19.00	0.75-1.50	0.030	0.040	0.025	—	Ti,Nb,Zr or combination thereof 8(C + N) to 0.80

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21	X02Cr18Mo1TiNbZr	436L1	0.025	1.00	1.00	—	17.00-20.00	0.40-0.80	0.030	0.040	0.025	—	Ti,Nb, Zr or combination thereof 8(C + N) to 0.80
22	X02Cr18Ti	439	0.030	1.00	1.00	0.50	17.0-19.0	—	0.030	0.040	0.030	—	Ti [0.2+4 (C+N)] *Min*, 1.1 *Max*; Al 0.15 *Max*
23	X02Cr18TiNb	439Ti1	0.030	1.00	1.00	0.50	17.0-19.0	—	0.030	0.040	0.030	—	(Ti+Nb) [0.20+4(C+N)] *Min*, 0.75 *Max;* Al 0.15
24	X02Cr18TiNb	439Ti2	0.030	1.00	1.00	—	17.5-18.5	—	0.015	0.040	—	—	Ti (0.1-0.6); Nb [(0.3 + (3 x C)] *Min*
25	X02Cr19TiNb	441	0.030	1.00	1.00	1.00	17.5-19.5	—	0.030	0.040	0.030	—	Ti (0.1-0.5) Nb [0.3+(9xC) *Min*, 0.90 *Max*
26	X10Cr20	442	0.20	1.00	1.00	0.60	18.0-23.0	—	0.040	0.040	—	—	—
27	X02Cr21CuTiNb	443	0.025	1.00	1.00	—	20.0-23.0	—	0.030	0.040	0.025	0.30-0.80	(Ti+Nb) 8x(C+N) *Min*, 0.80*Max*
28	X02Cr18Mo2TiNb	444	0.025	1.00	1.00	1.00	17.5-19.5	1.75-2.50	0.030	0.040	0.035	—	(Ti+Nb)[0.20+4 (C+N)]*Min*, 0.80 *Max*
29	X02Cr20CuNb	445	0.020	1.00	1.00	0.60	19.0-21.0	—	0.012	0.040	0.030	0.30-0.60	Nb 10x(C+N) Min, 0.80 *Max*
30	X02Cr22Mo1	445L1	0.025	1.00	1.00	—	21.00-24.00	0.70-1.50	0.030	0.040	0.025	—	—
31	X02Cr22Mo2	445L2	0.025	1.00	1.00	—	21.00-24.00	1.50-2.50	0.030	0.040	0.025	—	—
32	X10Cr25	446S1	0.20	1.00	1.50	0.75	23.0-27.0	—	0.030	0.040	0.25	—	—
33	X03Cr26Mo1Ti	446S2	0.06	0.75	0.75	0.50	25.0-27.0	0.75-1.50	0.020	0.040	0.040	0.20	Ti 0.20-1.00; Ti 7(C+N) *Min*
34	X01Cr26Mo1Nb	446S3	0.010	0.40	0.40	0.50	25.0-27.5	0.75-1.50	0.020	0.020	0.015	0.20	Nb 0.05-0.20; (Ni+Cu) 0.50
ii)	*Martensitic steels:*												
1	X08Cr12	403	0.15	0.50	1.00	0.60	11.5-13.0	—	0.030	0.040	—	—	—
2	X 12Cr12	410	0.08-0.15	1.00	1.00	0.75	11.5-13.5	—	0.030	0.040	—	—	—
3	X02Cr13Ni4Mn1Mo1	415	0.05	0.60	0.50-1.00	3.5-5.5	11.5-14.0	0.50-1.00	0.030	0.030	—	—	—

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4	X 20Cr13	420 S1	0.16-0.25	1.00	1.00	1.00	12.0-14.0	—	0.030	0.040	—	—	—
5	X 30Cr13	420 S2	0.26-0.35	1.00	1.00	1.00	12.0-14.0	—	0.030	0.040	—	—	—
6	X 40Cr13	420 S3	0.35-0.45	1.00	1.00	1.00	12.5-14.0	—	0.030	0.040	—	—	—
7	X20Cr12Ni1Mn1Mo1V W	422	0.20-0.25	0.50	0.50-1.00	0.50-1.00	11.0-12.5	0.90-1.25	0.025	0.025	—	—	V 0.20-0.30; W 0.90-1.25
8	X 15Cr16Ni2	431	0.10-0.20	1.00	1.00	1.25-2.50	15.0-17.0	—	0.030	0.045	—	—	—
9	X 108Cr17Mo	440	0.95-1.20	1.00	1.00	0.50	16.0-18.0	0.75	0.030	0.045	—	—	—
iii)	*Austenitic steels:*												—
1	X 10Cr17Mn6Ni4N20	201	0.15	1.00	5.5-7.5	3.5-5.5	16.0-18.0	—	0.030	0.060	0.25	—	—
2	X 07Cr17Mn12Ni4	201 A	0.12	1.00	10.0-14.0	3.5-5.5	16.0-18.0	—	0.030	0.090	0.25	—	—
3	X 10Cr18Mn9Ni5	202	0.15	1.00	7.5-10.0	4.0-6.0	17.0-19.0	—	0.030	0.060	0.25	—	—
4	X 10Cr15Mn9Cu2Ni1N	N1	0.12	0.75	8.5-10.5	1.0-2.0	14.5-16.0	—	0.030	0.080	0.08-0.20	1.50-2.50	—
5	X 8Cr16Mn8Cu2Ni2N	N2	0.10	1.0	6.5-9.0	1.5-3.5	15.5-17.0	—	0.030	0.070	0.10-0.25	2.00-4.00	—
6	X 8Cr16Mn7Cu2Ni4N	N3	0.09	0.75	6.0-8.0	4.0-6.0	16.0-17.5	—	0.030	0.070	0.05-0.15	1.50-2.50	—
7	X02Cr17Mn6Ni4	201S	0.030	0.75	5.50-7.50	3.5-5.5	16.0-18.0	—	0.030	0.045	0.25	—	—
8	X02Cr17Mn7Ni4N	201LN	0.030	0.75	6.40-7.50	4.0-5.0	16.0-17.5	—	0.015	0.045	0.10-0.25	1.00	—
9	X10Cr16Mn5Ni5Si3N	201N	0.15	3.00-4.00	4.00-6.00	4.0-6.0	15.0-18.0	—	0.040	0.040	0.08-0.20	—	—
10	X02Cr16Mn8Ni2N	204	0.030	1.00	7.00-9.00	1.50-3.00	15.0-17.0	—	0.030	0.040	0.15-0.30	—	—
11	X10Cr17Mn6Cu2Ni3N	204Cu1	0.12	1.00	5.00-7.00	2.0-4.0	17.0-18.0	—	0.030	0.045	0.10-0.25	1.50-3.50	—
12	X05Cr17Mn4Cu2Ni5N	204Cu2	0.08	1.00	3.00-5.00	4.0-6.0	17.0-18.0	—	0.030	0.045	0.05-0.20	2.00-3.00	—
13	X05Cr17Mn6Cu2Ni4N	204Cu3	0.08	1.00	5.5-7.5	3.5-5.5	17.0-18.0	—	0.030	0.045	0.10-0.25	1.5-3.5	—

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14	X05Cr19Mn8Ni6Mo2N	216S1	0.08	0.75	7.5-9.00	5.0-7.0	17.5-22.0	2.00-3.00	0.030	0.045	0.25-0.50	—	—
15	X02Cr19Mn8Ni6Mo2N	216S2	0.03	0.75	7.50-9.00	5.0-7.0	17.5-22.0	2.00-3.00	0.030	0.045	0.25-0.50	—	—
16	X 10Cr17Ni7	301	0.15	1.00	2.00	6.0-8.0	16.0-18.0	—	0.030	0.045	0.10	—	—
17	X 02Cr17Ni7	301 L	0.03	1.00	2.00	6.0-8.0	16.0–18.0	—	0.030	0.045	0.20	—	—
18	X02Cr17Ni7N	301 LN	0.03	1.00	2.00	6.0-8.0	16.0–18.0	—	0.030	0.045	0.07-0.20	—	—
19	X 07Cr18Ni9	302	0.15	0.75	2.00	8.0-10.0	17.0-19.0	—	0.030	0.045	0.10	—	—
20	X04Cr19Ni9	304	0.07	0.75	2.00	8.0-10.5	17.5-19.5	—	0.030	0.045	0.10	—	—
21	X 02Cr19Ni10	304 L	0.030	0.75	2.00	8.0-12.0	17.5-19.5	—	0.030	0.045	0.10	—	—
22	X 07Cr19Ni9	304H	0.04-0.10	0.75	2.00	8.0-10.5	18.0-20.0	—	0.030	0.045	—	—	—
23	X 02Cr19Ni10N	304LN	0.030	0.75	2.00	8.0 – 12.0	18.00-20.00	—	0.030	0.045	0.10-0.16	—	—
24	X 04Cr19Ni9N	304N	0.08	0.75	2.00	8.0-10.5	18.0-20.0	—	0.030	0.045	0.10-0.16	—	—
25	X05Cr18Ni9Si1CeN	304Ce	0.04-0.06	1.00-2.00	0.80	9.0-10.0	18.0-19.0	—	0.030	0.045	0.12-0.18	—	Ce 0.03-0.08
26	X05Cr17Ni8Cu2	304Cu	0.08	1.00	2.00	7.0-9.0	16.0-18.0	—	0.030	0.045	—	—	—
27	X05Cr18Ni9Cu2NbW	304CuW	0.08	1.0-2.0	2.00	8.0-10.5	17.5-19.5	—	0.030	0.045	—	—	Nb 0.1-0.5; W 0.2-0.8
28	X04Cr16Ni7Cu	304Mn1	0.08	1.70	3.00	6.00-9.00	15.0-18.0	—	0.030	0.045	—	1.0-3.0	—
29	X04Cr16Ni7MnCu	304Mn2	0.08	1.70	3.00-5.00	6.00-9.00	15.0-18.0	—	0.030	0.045	—	1.0-3.0	—
30	X05Cr19Ni9N	304N2	0.08	0.75	2.00	8.0-10.5	18.0-20.0	—	0.030	0.045	0.16-0.30	—	—
31	X08Cr16Ni13Nb	304Nb	0.040-0.10	0.3-0.6	1.50	12.0-14.0	15.0-17.0	—	0.015	0.035	—	—	Nb 10 x C *Min*, 1.20 *Max*
32	X06Cr18Ni12	305	0.12	0.75	2.00	10.5-13.0	17.0-19.0	—	0.030	0.045	—	—	—
33	X04Cr19Ni10Cu3Mo	305Cu	0.08	0.50-2.50	2.00	8.5-11.5	17.0-20.5	0.75-1.50	0.030	0.045	—	0.75-3.50	—
34	X07Cr21Ni11Ce	308Ce	0.05-0.10	1.40-2.00	0.80	10.0-12.00	20.0-22.0	—	0.030	0.040	0.14-0.20	—	Ce 0.03-0.08
35	X15Cr24Ni13	309	0.20	1.5	2.00	11.0-15.0	22.0-25.0	—	0.030	0.045	—	—	—
36	X 04Cr23Ni14	309 S	0.08	0.75	2.00	12.0-15.0	22.0-24.0	—	0.030	0.045	—	—	—

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37	X05Cr23Ni13	309H	0.04-0.10	0.75	2.00	12.0-15.0	22.0-24.0	—	0.030	0.045	—	—	—
38	X05Cr23Ni13Nb	309Nb	0.08	0.75	2.00	12.0-16.0	22.0-24.0	—	0.030	0.045	—	—	Nb 10xC *Min*, 1.10 *Max*
39	X07Cr23Ni13Nb	309HNb	0.04-0.10	0.75	2.00	12.0-16.0	22.0-24.0	—	0.030	0.045	—	—	Nb 10xC *Min*, 1.10 *Max*
40	X20Cr25Ni20	310	0.25	2.5	2.00	18.0-21.0	24.0-26.0	—	0.030	0.045	—	—	—
41	X 04Cr25Ni20	310 S	0.08	1.50	2.00	19.0–22.0	24.0-26.0	—	0.030	0.045	—	—	—
42	X07Cr25Ni20	310H	0.04-0.10	0.75	2.00	19.0-22.0	24.0-26.0	—	0.030	0.045	—	—	—
43	X15Cr25Ni21Si	310N	0.20	1.5-2.5	2.00	19.0-22.0	24.0-26.0	—	0.015	0.045	—	—	—
44	X05Cr25Ni20Nb	310Nb	0.08	1.50	2.00	19.0-22.0	24.0-26.0	—	0.030	0.045	—	—	Nb 10xC *Min*, 1.10 *Max*
45	X07Cr25Ni20Nb	310HNb	0.04-0.10	0.75	2.00	19.0-22.0	24.0-26.0	—	0.030	0.045	—	—	Nb 10xC *Min*, 1.10 *Max*
46	X01Cr25Ni21Mo2N	310MoLN	0.020	0.50	2.00	20.5-23.5	24.0-26.0	1.60-2.60	0.010	0.030	0.09-0.15	—	—
47	X02Cr20Ni18Mo6CuN	312	0.020	0.80	1.00	17.5-18.5	19.5-20.5	6.0-6.5	0.010	0.030	0.18-0.25	0.50-1.00	—
48	X 04Cr17Ni12Mo2	316	0.08	0.75	2.00	10.0-14.0	16.0-18.0	2.0-3.0	0.030	0.045	0.10	—	—
49	X 02Cr17Ni12Mo2	316 L	0.030	0.75	2.00	10.0-14.0	16.0-18.0	2.0-3.0	0.030	0.045	0.10	—	—
50	X 07Cr17Ni12Mo2	316 H	0.04-0.10	0.75	2.00	10.0-14.0	16.0-18.0	2.0–3.0	0.030	0.045	—	—	—
51	X 02Cr17Ni12Mo2N	316 LN	0.030	0.75	2.00	10.0-14.0	16.0-18.0	2.0–3.0	0.030	0.045	0.10-0.16	—	—
52	X 04Cr17Ni12Mo2Ti	316 Ti	0.08	0.75	2.00	10.0-14.0	16.0-18.0	2.0-3.0	0.030	0.045	0.10	—	Ti 5x(C + N) *Min,* 0.70 *Max*
53	X05Cr17Ni12Mo2Nb	316Nb	0.08	0.75	2.00	10.0-14.0	16.0-18.0	2.00-3.00	0.030	0.045	0.10	—	Nb 10xC *Min*, 1.10 *Max*
54	X05Cr17Ni12Mo2N	316N1	0.08	0.75	2.00	10.0-14.0	16.0-18.0	2.00-3.00	0.030	0.045	0.10-0.16	—	—
55	X02Cr20Ni9Mo1N	316N2	0.03	1.00	2.00	8.0-9.5	19.5-21.5	0.50-1.50	0.015	0.045	0.14-0.25	1.0	—
56	X 04Cr19Ni13Mo3	317	0.08	0.75	2.00	11.0-15.0	18.0-20.0	3.0–4.0	0.030	0.045	0.10	—	—
57	X 02Cr19Ni13Mo3	317 L	0.030	0.75	2.00	11.0-15.0	18.0-20.0	3.0–4.0	0.030	0.045	0.10	—	—
58	X02Cr19Ni14Mo4	317LM	0.030	0.75	2.00	13.5-17.5	18.0-20.0	4.0-5.0	0.030	0.045	0.20	—	—

Sl No. (1)	**Grade Designation** Letter Sumbol **[*see* IS 1762 (Part 1)]** (2)	**Numerical Symbol ISS** (3)	**C** *Max* (4)	**Si** *Max* (5)	**Mn** *Max* (6)	**Ni** *Max* (7)	**Cr** (8)	**Mo** (9)	**S** *Max* (10)	**P** *Max* (11)	**N** *Max* (12)	**Cu** *Max* (13)	**Others** (14)
59	X02Cr18Ni14Mo4N	317LMN	0.030	0.75	2.00	13.5-17.5	17.0-20.0	4.0-5.0	0.030	0.045	0.10-0.20	—	—
60	X02Cr18Ni15Mo4Cu3N	317LCu	0.030	1.00	1.00	14.5-16.5	17.5-19.0	3.8-4.5	0.030	0.030	0.15-0.21	2.8-4.0	—
61	X02Cr19Ni12Mo3N	317LN	0.030	0.75	2.00	11.0-15.0	18.0-20.0	3.0-4.0	0.030	0.045	0.10-0.22	—	—
62	X 04Cr18Ni10Ti	321	0.08	0.75	2.00	9.0-12.0	17.0-19.0	—	0.030	0.045	0.10	—	Ti 5 x(C + N) *Min*, 0.70 *Max*
63	X07Cr18Ni10Ti	321H	0.04-0.10	0.75	2.00	9.0-12.0	17.0-19.0	—	0.030	0.045	—	—	Ti 4x(C+N)*Min*, 0.70 *Max*
64	X02Cr24Ni22Mo7N	326	0.020	0.50	2.00-4.00	21.0-23.0	24.0-25.0	7.0-8.0	0.005	0.030	0.45-0.55	0.30-0.60	—
65	X07Cr22Ni21Mo2Ti	334	0.08	1.00	1.50	20.0-23.0	21.0-23.0	2.00-3.00	0.020	0.045	—	—	Al 0.15-0.60; Ti 0.15-0.60
66	X02Cr24Ni17Mo4Mn6N	345	0.030	1.00	5.00-7.00	16.0-18.0	23.0-25.0	4.0-5.0	0.010	0.030	0.40-0.60	—	Nb 0.10
67	X 04Cr18Ni10Nb	347	0.08	0.75	2.00	9.0-13.0	17.0-19.0	—	0.030	0.045	—	—	Nb 10xC – 1.00 *Max*
68	X07Cr18Ni10Nb	347H	0.04-0.10	0.75	2.00	9.0-13.0	17.0-19.0	—	0.030	0.045	—	—	Nb 8xC *Min*, 1.00 *Max*
69	X01Cr18Ni10NbN	347LN	0.005-0.020	1.00	2.00	9.0-13.0	17.0-19.0	—	0.030	0.045	0.06-0.10	—	Nb 0.20-0.50 15xC *Min*
70	X05Cr18Ni10NbTa	348	0.08	0.75	2.00	9.0-13.0	17.0-19.0	—	0.030	0.045	—	—	(Nb+Ta)10 x C min, 1.00*Max*; Ta 0.10 Co 0.20
71	X07Cr18Ni10NbTa	348H	0.04-0.10	0.75	2.00	9.0-13.0	17.0-19.0	—	0.030	0.045	—	—	(Nb+Ta) 8xC*Min*, 1.00*Max* Ta 0.10 Co 0.20
72	X02Cr21Ni25Cu	904L	0.020	1.00	2.00	23.0-28.0	19.0-23.0	4.00-5.00	0.035	0.045	0.10	1.00-2.00	—
73	X01Cr20Ni25Mo6Cu	904LN	0.020	0.50	2.00	24.0-26.0	19.0-21.0	6.00-7.00	0.010	0.030	0.15-0.25	0.50-1.50	—
iv)	*Duplex:*												
1	X02Cr22Ni5Mo3N	1803	0.030	1.00	2.00	4.5-6.5	21.0-23.0	2.5-3.5	0.020	0.030	0.08-0.20	—	—
2	X02Cr21Mn3Ni2N	2011	0.030	1.00	2.00-3.00	1.0-2.0	20.5-23.5	0.10-1.00	0.020	0.040	0.15-0.27	0.50	—
3	X03Cr20Mn3Ni1N	2012	0.05	0.80	2.00-4.00	0.8-1.5	19.0-20.5	0.10-0.60	0.005	0.040	0.16-0.26	1.00	—

Sl No. (1)	**Grade Designation** Letter Sumbol **[*see* IS 1762 (Part 1)]** (2)	**Numerical Symbol ISS** (3)	**C** ***Max*** (4)	**Si** ***Max*** (5)	**Mn** ***Max*** (6)	**Ni** ***Max*** (7)	**Cr** (8)	**Mo** (9)	**S** ***Max*** (10)	**P** ***Max*** (11)	**N** ***Max*** (12)	**Cu** ***Max*** (13)	**Others** (14)
4	X03Cr20Ni3Mo1N	2031	0.05	0.80	2.50	2.0-4.0	19.0-22.0	0.60-1.40	0.005	0.040	0.14-0.24	1.00	—
5	X02Cr21Mn5Ni2N	2101	0.040	1.00	4.00-6.00	1.35-1.70	21.0-22.0	0.10-0.80	0.030	0.040	0.20-0.25	0.10-0.80	—
6	X02Cr22Ni6Mo3N	2205	0.030	1.00	2.00	4.5-6.5	22.0-23.0	3.0-3.5	0.020	0.03	0.14-0.20	—	—
7	X02Cr23Ni4CuN	2304	0.030	1.00	2.50	3.0-5.5	21.5-24.5	0.05-0.60	0.030	0.04	0.05-0.20	0.05-0.60	—
8	X02Cr23Ni4MoCu	2441	0.030	0.70	2.50-4.00	3.0-4.5	23.0-25.0	1.00-2.00	0.005	0.035	0.20-0.30	0.10-0.80	—
9	X02Cr25Ni7Mo4CuN	2507	0.030	0.80	1.20	6.0-8.0	24.0-26.0	3.0-5.0	0.020	0.035	0.24-0.32	0.50	—
10	X02Cr25Ni7Mo3CuWN	2760	0.030	1.00	1.00	6.0-8.0	24.0-26.0	3.0-4.0	0.010	0.030	0.20-0.30	0.50-1.00	W 0.50-1.00

Constituent	*Limits, Percent, Max*		
	Ferritic and Martensitic Steels	Austenitic Steels	
		Without Specified Molybdenum	With Specified Molybdenum
Titanium	—	0.10	0.10
Niobium	—	0.20	0.20
Molybdenum	0.30	0.70	—
Copper	0.30	0.50	0.70

[1)] Maximum, unless range or minimum is indicated.

Table 2 Permissible Variation Between Specified Analysis and Product Analysis
(*Clause* **7.2**)

Sl No.	**Element**	**Limits of Ladle Analysis as Shown in Table 1** Percent		**Permissible Deviation**[1] Percent
		Over	Up to and Including	
(1)	(2)	(3)	(4)	(5)
i)	C	—	0.030	+ 0.005
		0.030	0.20	±0.01
		0.20	0.60	± 0.02
		0.60	1.20	± 0.03
ii)	Si	—	1.0	± 0.05
		1.0	2.5	± 0.10
iii)	Mn	—	1.0	± 0.03
		1.0	3.0	± 0.04
		3.0	6.0	± 0.05
		6.0	10.0	± 0.06
		10.0	14.0	± 0.10
iv)	Al	—	0.30	± 0.05
v)	Cr	10.0	15.0	± 0.15
		15.0	20.0	± 0.20
		20.0	30.0	± 0.25
vi)	Mo	—	0.60	+ 0.03
		0.60	1.75	± 0.05
		1.75	3.0	± 0.10
vii)	Ni	—	1.0	+ 0.03
		1.0	5.0	± 0.07
		5.0	10.0	± 0.10
		10.0	20.0	± 0.15
		20.0	30.0	± 0.20
viii)	N	---	0.02	± 0.005
		0.02	0.15	± 0.01
		0.15	0.35	± 0.02
ix)	Ti	—	1.0	+ 0.05
x)	Nb	—	1.2	+ 0.05
xi)	S	—	0.040	+ 0.005
		0.04	0.20	± 0.01
		0.20	0.50	± 0.02
xii)	P	—	0.040	+ 0.005
		0.040	0.10	± 0.010
xiii)	Ta	—	1.5	+ 0.05
xiv	Cu	—	0.5	+ 0.03
		0.5	1.0	± 0.05
		1.0	3.0	± 0.10
		3.0	4.0	± 0.15
xv)	V	—	0.5	+ 0.03
		0.5	1.5	± 0.05
xvi)	W	—	1.0	+ 0.03
		1.0	2.0	± 0.05

NOTE — Tolerance shall be mutuallyas agreed to between the purchaser and the supplier for other alloying elements.

[1] The use of ′+′means that in one cast the deviation may occur over the upper value or under the lower value of the specified range in the table but not both at the same time.

Table 3 Recommended Heat Treatment for Stainless Steels

(*Clauses* 8.4 *and* 14.2)

Sl No.	Grade Designation		Symbols1)	Annealingor Softening Temperature °C	Quenching Media for Annealing or Softening1)	Symbols2)	Hardening Temperature °C	Quenching Media for Hardening	Tempering Temperature °C
	Letter Symbol [*see* IS 1762 (Part 1)]	Numerical Symbol ISS							
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
i)	*Ferritic steels*:								
1	X 04Cr12Al	405	A	750 to 800	f, a	—	—	—	—
2	X 02Cr12Ti	409	A	800 to 1050	w, a	—	—	—	—
3	X 02Cr12	409 M	A	700 to 820	f, w, a	—	—	—	—
4	X02Cr12Ti	409Ti1	A	780 to 1050	w,a	—	—	—	—
5	X02Cr12TiNb	409Ti2	A	780 to 1050	w,a	—	—	—	—
6	X02Cr12Ni1Ti	409Ti3	A	780 to 1050	w,a	—	—	—	—
7	X05Cr12Ti	409Ti4	A	780 to 1050	w,a	—	—	—	—
8	X02Cr12Ti	409Ti5	A	780 to 1050	w,a	—	—	—	—
9	X 04Cr12	410S	A	700 to 850	f, w, a	—	—	—	—
10	X02Cr13Nb	410S1	A	780 to 1050	w,a	—	—	—	—
11	X02Cr12Ni1	410S2	A	780 to 1050	w,a	—	—	—	—
12	X05Cr14Ni2Mo1Ti	410S3	A	800 to 1050	w,a	—	—	—	—
13	X10Cr15	429	A	780 to 1050	w,a	—	—	—	—
14	X01Cr15Nb	429Nb	A	800 to 1050	w,a	—	—	—	—
15	X 07Cr17	430	A	750 to 850	w, a	—	—	—	—
16	X02Cr17TiNb	430Ti	A	780 to 1050	w,a	—	—	—	—
17	X02Cr17CuTiNbZr	430Ti1	A	800 to 1050	w,a	—	—	—	—
18	X08Cr17Mo1	434	A	780 to 850	w,a	—	—	—	—
19	X02Cr17Mo1Nb	436	A	800 to 1050	w,a	—	—	—	—
20	X02Cr17Mo2TiNbZr	436L	A	800 to 1050	w,a	—	—	—	—
21	X02Cr18Mo1TiNbZr	436L1	A	800 to 1050	w,a	—	—	—	—
22	X 02Cr18Ti	439	A	800 to 1050	w, a	—	—	—	—
23	X02Cr18TiNb	439Ti1	A	780 to 1050	w,a	—	—	—	—
24	X02Cr18TiNb	439Ti2	A	780 to 1050	w,a	—	—	—	—
25	X02Cr19TiNb	441	A	780 to 1050	w,a	—	—	—	—
26	X10Cr20	442	A	780 to 1050	w,a	—	—	—	—
27	X02Cr21CuTiNb	443	A	800 to 1050	w,a	—	—	—	—
28	X02Cr18Mo2TiNb	444	A	800 to 1050	w,a	—	—	—	—
29	X02Cr20CuNb	445	A	800 to 1050	w,a	—	—	—	—
30	X02Cr22Mo1	445L1	A	800 to 1050	w,a	—	—	—	—
31	X02Cr22Mo2	445L2	A	800 to 1050	w,a	—	—	—	—
32	X10Cr25	446S1	A	780 to 850	w,a	—	—	—	—
33	X03Cr26Mo1Ti	446S2	A	800 to 1050	w,a	—	—	—	—
34	X01Cr26Mo1Nb	446S3	A	800 to 1050	w,a	—	—	—	—
ii)	*Martensitic steels*:								
1	X08Cr12	403	A	750 to 870	f,a	Q+T	950 to 1000	o,a	700 to 750
2	X 12Cr12	410	A1	700 to 780	f, a	Q+T	950 to 1 000	o, a	700 to 750
			A2	770 to 870	f, a	—	—	—	—
3	X02Cr13Ni4Mn1Mo1	415	A	750 to 870	f,a	Q+T	950 to 1050	o,a	560 to 640
4	X 20Cr13	420 S1	A	770 to 870	f, a	Q+T	980 to 1 030	o, a	650 to 770
5	X 30Cr13	420 S2	A	770 to 870	f, a	Q+T1	980to 1 030	o, a	630 to 700
						Q + T2	980 to 1 030	o, a	100 to 250
6	X40Cr13	420 S3	A	770 to 870	f, a	Q + T	1 000 to 1 050	o, a	100 to 250
7	X20Cr12Ni1Mn1Mo1VW	422	A	750 to 870	f,a	Q+T	980 to 1030	o,a	650 to 770

Sl No.	**Grade Designation**		**Symbols1)**	**Annealingor Softening Temperature °C**	**Quenching Media for Annealing or Softening1)**	**Symbols2)**	**Hardening Temperature °C**	**Quenching Media for Hardening**	**Tempering Temperature °C**
	Letter Symbol [*see* IS 1762 (Part 1)]	Numerical Symbol ISS							
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
8	X 15Cr16Ni2	431	A	750 to 800	f, a	Q+T	980 to 1 030	o, a	630 to 700
			S	620 to 670	f, a	-	-	-	-
9	X 108Cr17Mo	440	A	780 to 880	f, a	Q+T	1 000 to 1 030	o, a	100 to 250
iii)	*Austenitic steels*:								
1	X10Cr17Mn6Ni4N20	201	SA	1 000 to 1 120	w, a				
2	X07Cr17Mn12Ni4	201 A	SA	1 000 to 1 120	w, a	—	—	—	—
3	X 10Cr18Mn9Ni5	202	SA	1 000 to 1 120	w, a	—	—	—	—
4	X10Cr15Mn9Cu2Ni1N	N1	SA	950 to 1 120	w, a	—	—	—	—
5	X8Cr16Mn8Cu2Ni2N	N2	SA	950 to 1 120	w, a	—	—	—	—
6	X8Cr16Mn7Cu2Ni4N	N3	SA	950 to 1 120	w, a	—	—	—	—
7	X02Cr17Mn6Ni4	201S	SA	1 000 to 1 120	w, a	—	—	—	—
8	X02Cr17Mn7Ni4N	201LN	SA	1 000 to 1 120	w, a	—	—	—	—
9	X10Cr16Mn5Ni5Si3N	201N	SA	1 000 to 1 120	w, a	—	—	—	—
10	X02Cr16Mn8Ni2N	204	SA	1 000 to 1 120	w, a	—	—	—	—
11	X10Cr17Mn6Cu2Ni3N	204Cu1	SA	1 000 to 1 120	w, a	—	—	—	—
12	X05Cr17Mn4Cu2Ni5N	204Cu2	SA	1 000 to 1 120	w, a	—	—	—	—
13	X05Cr17Mn6Cu2Ni4N	204Cu3	SA	1 000 to 1 120	w, a	—	—	—	—
14	X05Cr19Mn8Ni6Mo2N	216S1	SA	1 000 to 1 120	w, a	—	—	—	—
15	X02Cr19Mn8Ni6Mo2N	216S2	SA	1 000 to 1 120	w, a	—	—	—	—
16	X 10Cr17Ni7	301	SA	1 000 to 1 120	w, a	—	—	—	—
17	X 02Cr17Ni7	301 L	SA	1 000 to 1 120	w, a	—	—	—	—
18	X 02Cr17Ni7N	301 LN	SA	1 000 to 1 120	w, a	—	—	—	—
19	X 07Cr18Ni9	302	SA	1 000 to 1 120	w, a	—	—	—	—
20	X 04Cr19Ni9	304	SA	1 000 to I 120	w, a	—	—	—	—
21	X 02Cr19Ni10	304 L	SA	1 000 to 1 120	w, a	—	—	—	—
22	X 07Cr19Ni9	304 H	SA	1 000 to 1 120	w, a	—	—	—	—
23	X 02Cr19Ni10N	304 LN	SA	1 000 to 1 120	w, a	—	—	—	—
24	X 04Cr19Ni9N	304 N	SA	1 000 to 1 120	w, a	—	—	—	—
25	X05Cr18Ni9Si1CeN	304Ce	SA	1 000 to 1 120	w, a	—	—	—	—
26	X05Cr17Ni8Cu2	304Cu	SA	1 000 to 1 120	w, a	—	—	—	—
27	X05Cr18Ni9Cu2NbW	304CuW	SA	1 000 to I 120	w, a	—	—	—	—
28	X04Cr16Ni7Cu	304Mn1	SA	1 000 to 1 120	w, a	—	—	—	—
29	X04Cr16Ni7MnCu	304Mn2	SA	1 000 to 1 120	w, a	—	—	—	—
30	X05Cr19Ni9N	304N2	SA	1 000 to 1 120	w, a	—	—	—	—
31	X08Cr16Ni13Nb	304Nb	SA	1 000 to 1 120	w, a	—	—	—	—
32	X06Cr18Ni12	305	SA	1 000 to 1 120	w, a	—	—	—	—
33	X04Cr19Ni10Cu3Mo	305 Cu	SA	1 000 to 1 120	w, a	—	—	—	—
34	X07Cr21Ni11Ce	308Ce	SA	1 000 to 1 120	w, a	—	—	—	—
35	X15Cr24Ni13	309	SA	1 000 to 1 120	w, a	—	—	—	—
36	X 04Cr23Ni14	309 S	SA	1 000 to 1 120	w, a	—	—	—	—
37	X05Cr23Ni13	309H	SA	1 000 to 1 120	w, a	—	—	—	—
38	X05Cr23Ni13Nb	309Nb	SA	1 000 to 1 120	w, a	—	—	—	—
39	X07Cr23Ni13Nb	309HNb	SA	1 000 to 1 120	w, a	—	—	—	—
40	X20Cr25Ni20	310	SA	1 000 to 1 120	w, a	—	—	—	—
41	X 04Cr25Ni20	310 S	SA	1 000 to 1 120	w, a	—	—	—	—
42	X07Cr25Ni20	310H	SA	1 000 to 1 120	w, a	—	—	—	—
43	X15Cr25Ni21Si	310N	SA	1 000 to 1 120	w, a	—	—	—	—

Sl No.	**Grade Designation**		**Symbols1)**	**Annealingor Softening Temperature °C**	**Quenching Media for Annealing or Softening1)**	**Symbols2)**	**Hardening Temperature °C**	**Quenching Media for Hardening**	**Tempering Temperature °C**
	Letter Symbol [*see* IS 1762 (Part 1)]	Numerical Symbol ISS							
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
44	X05Cr25Ni20Nb	310Nb	SA	1 000 to 1 120	w, a	—	—	—	—
45	X07Cr25Ni20Nb	310HNb	SA	1 000 to 1 120	w, a	—	—	—	—
46	X01Cr25Ni21Mo2N	310MoLN	SA	1 000 to 1 120	w, a	—	—	—	—
47	X02Cr20Ni18Mo6CuN	312	SA	1 000 to 1 120	w, a	—	—	—	—
48	X 04Cr17Ni12M02	316	SA	1 000 to 1 120	w, a	—	—	—	—
49	X 02Cr17Nil2Mo2	316 L	SA	1 000 to 1 120	w, a	—	—	—	—
50	X 07Cr17Ni12Mo2	316 H	SA	1000 to 1 120	w, a	—	—	—	—
51	X 02Cr17Ni12Mo2N	316 LN	SA	1 000 to 1 120	w, a	—	—	—	—
52	X 04Cr17Ni12Mo2Ti	316 Ti	SA	1 000 to 1 120	w, a	—	—	—	—
53	X05Cr17Ni12Mo2Nb	316Nb	SA	1 000 to 1 120	w, a	—	—	—	—
54	X05Cr17Ni12Mo2N	316N1	SA	1 000 to 1 120	w, a	—	—	—	—
55	X02Cr20Ni9Mo1N	316N2	SA	1 000 to 1 120	w, a	—	—	—	—
56	X 04Cr19Ni13Mo3	317	SA	1 000 to 1 120	w, a	—	—	—	—
57	X 02Cr19Ni13Mo3	317 L	SA	1 000 to 1 120	w, a	—	—	—	—
58	X02Cr19Ni14Mo4	317LM	SA	1 000 to 1 120	w, a	—	—	—	—
59	X02Cr18Ni14Mo4N	317LMN	SA	1 000 to 1 120	w, a	—	—	—	—
60	X02Cr18Ni15Mo4Cu3N	317LCu	SA	1 000 to 1 120	w, a	—	—	—	—
61	X02Cr19Ni12Mo3N	317LN	SA	1 000 to 1 120	w, a	—	—	—	—
62	X 04Cr18Ni10Ti	321	SA	1 000 to 1 120	w, a	—	—	—	—
63	X07Cr18Ni10Ti	321H	SA	1 000 to 1 120	w, a	—	—	—	—
64	X02Cr24Ni22Mo7N	326	SA	1 000 to 1 120	w, a	—	—	—	—
65	X07Cr22Ni21Mo2Ti	334	SA	1 000 to 1 120	w, a	—	—	—	—
66	X02Cr24Ni17Mo4Mn6N	345	SA	1 000 to 1 120	w, a	—	—	—	—
67	X04Cr18Ni10Nb	347	SA	1 000 to 1 120	w, a	—	—	—	—
68	X07Cr18Ni10Nb	347H	SA	1 000 to 1 120	w, a	—	—	—	—
69	X01Cr18Ni10NbN	347LN	SA	1 000 to 1 120	w, a	—	—	—	—
70	X05Cr18Ni10NbTa	348	SA	1 000 to 1 120	w, a	—	—	—	—
71	X07Cr18Ni10NbTa	348H	SA	1 000 to 1 120	w, a	—	—	—	—
72	X02Cr21Ni25Cu	904L	SA	1095 *Min*	w, a	—	—	—	—
73	X01Cr20Ni25Mo6Cu	904LN	SA	1 100 *Min*	w, a	—	—	—	—
iv)	*Duplex*:								
1	X02Cr22Ni5Mo3N	1803	SA	1040 *Min*	w, a	—	—	—	—
2	X02Cr21Mn3Ni2N	2011	SA	1010 *Min*	w, a	—	—	—	—
3	X03Cr20Mn3Ni1N	2012	SA	1000 *Min*	w, a	—	—	—	—
4	X03Cr20Ni3Mo1N	2031	SA	1000 *Min*	w, a	—	—	—	—
5	X02Cr21Mn5Ni2N	2101	SA	1020 *Min*	w, a	—	—	—	—
6	X 02Cr22Ni6Mo3N	2205	SA	1 040 *Min*	w, a	—	—	—	—
7	X 02Cr23Ni4CuN	2304	SA	980 *Min*	w, a	—	—	—	—
8	X02Cr23Ni4MoCu	2441	SA	1000 *Min*	w, a	—	—	—	—
9	X 02Cr25Ni7Mo4CuN	2507	SA	950 to 1 100	w, a	—	—	—	—
10	X02Cr25Ni7Mo3CuWN	2760	SA	1 100 *Min*	w, a	—	—	—	—

1) f = furnace, a = air, O =oil, and w = water.

2) SA = Solution Annealing, A = Annealing, Q = Quenching, T = Tempering, and S = Softening.

Austenitic Stainless Steels 200 and 300 series needs to be rapidly cooled during Quenching.

Table 4 Mechanical Properties in Annealed Condition

(*Clauses* 10.3.1 *and* 10.4)

Sl No.	**Grade Designation**		**Hardness**, *Max*			**Yield Strength,** *Min*, MPa **0.2 Percent Proof Stress**	**Tensile Strength** *Min,* MPa	**Elongation** Percent *Min* 50 mm	**Bend Test** D*ma*
	Letter Symbol [*see*IS 1762 (Part 1)]	Numerical Symbol ISS	Brinell HBS/HBW	Rockwell HRB	Vickers Load (1 to 30 kg)				
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
i)	Ferritic Steel								
1	X04Cr12Al	405	179	88	183	170	415	20	2a*
2	X02Cr12Ti	409	179	88	183	170	380	20	a *
3	X02Cr12	409 M	180	88	184	280	450	18	a*
4	X02Cr12Ti	409Ti1	179	88	183	170	380	20	a*
5	X02Cr12TiNb	409Ti2	179	88	183	170	380	20	a*
6	X02Cr12Ni1Ti	409Ti3	197	92	201	275	415	20	a*
7	X05Cr12Ti	409Ti4	162	80	165	175	360	22	a*
8	X02Cr12Ti	409Ti5	162	80	165	175	360	25	a*
9	X04Cr12	410 S	183	89	187	205	415	22	a*
10	X02Cr13Nb	410S1	162	80	165	205	380	22	a*
11	X02Cr12Ni1	410S2	183	89	187	205	415	22	a*
12	X05Cr14Ni2Mo1Ti	410S3	180	88	184	380	550	16	Not required
13	X10Cr15	429	183	89	187	205	450	22	a*
14	X01Cr15Nb	429Nb	183	89	187	210	380-560	25	a*
15	X07Cr17	430	183	89	187	205	450	22	2a*
16	X02Cr17TiNb	430Ti	183	88	187	175	360	22	a*
17	X02Cr17CuTiNbZr	430Ti1	192	90	196	205	390	22	a*
18	X08Cr17Mo1	434	183	89	187	240	450	22	a*
19	X02Cr17Mo1Nb	436	183	89	187	240	450	22	a*
20	X02Cr17Mo2TiNbZr	436 L	217	96	222	245	410	20	a*
21	X02Cr18Mo1TiNbZr	436 L1	192	90	196	245	410	20	a*
22	X02Cr18Ti	439	183	89	187	205	415	22	a *
23	X02Cr18TiNb	439Ti1	183	89	187	205	415	22	a*
24	X02Cr18TiNb	439Ti2	180	88	184	250	430	18	Not required
25	X02Cr19TiNb	441	190	90	194	241	414	20	Not required
26	X10Cr20	442	217	96	222	275	515	20	a*
27	X02Cr21CuTiNb	443	187	90	191	205	390	22	Not required
28	X02Cr18Mo2TiNb	444	217	96	222	275	415	20	a*
29	X02Cr20CuNb	**445**	165	83	167	205	427	22	a*
30	X02Cr22Mo1	**445L1**	217	96	222	245	410	20	a*
31	X02Cr22Mo2	445L2	217	96	222	245	410	20	a*
32	X10Cr25	446S1	217	96	222	275	515	20	a*
33	X03Cr26Mo1Ti	446 S2	217	96	222	310	470	20	a*
34	X01Cr26Mo1Nb	446S3	187	90	191	275	450	22	a*
ii)	Martensitic Steel								
1	X08Cr12	403	217	96	221	205	485	25	Not required
2	X12Cr12	410	217	96	222	205	450	20	Not required
3	X02Cr13Ni4Mn1Mo1	415	302	32[A]	306	620 *Max*	795 *Max*	15	Not required
4	X20Cr13	420 S1	225	95	232	—	700, *Max*	15	Not required
5	X30Cr13	420 S2	235	97	241	—	740, *Max*	15	Not required
6	X40Cr13	420 S3	240	98	247	—	760, *Max*	12	Not required
7	X20Cr12Ni1Mn1Mo1VW	422	248	24 [A]	252	—	—	—	Not required
8	X15Cr16Ni2	431	285	29[A]	295	—	—	—	Not required
9	X108Cr17Mo	440	285	29[A]	295	—	—	—	Not required

Sl No.	**Grade Designation**		**Hardness**, *Max*			**Yield Strength,** *Min*, MPa **0.2 Percent Proof Stress**	**Tensile Strength** *Min,* MPa	**Elongation** Percent *Min* 50 mm	**Bend Test** D*ma*
	Letter Symbol [*see*IS 1762 (Part 1)]	Numerical Symbol ISS	Brinell HBS/HBW	Rockwell HRB	Vickers Load (1 to 30 kg)				
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
iii)	Austenitic Steel								
1	X10Cr17Mn6Ni4N20	201	241	100	248	260	515	40	Not required
2	X07Cr17Mn12Ni4	201 A	217	95	222	260	540	40	Not required
3	X10Cr18Mn9Ni5	202	241	100	248	260	620	40	Not required
4	X10Cr15Mn9Cu2Ni1N	N1	241	100	248	345	650	40	Not required
5	X8Cr16Mn8Cu2Ni2N	N2	241	100	248	310	650	40	Not required
6	X8Cr16Mn7Cu2Ni4N	N3	241	100	248	275	600	40	Not required
7	X02Cr17Mn6Ni4	201S	217	95	222	260	655	40	Not required
8	X02Cr17Mn7Ni4N	201LN	241	100	248	310	655	45	Not required
9	X10Cr16Mn5Ni5Si3N	201N	255	25[A]	263	345	860	40	Not required
10	X02Cr16Mn8Ni2N	204	241	100	248	330	655	35	Not required
11	X10Cr17Mn6Cu2Ni3N	204Cu1	241	100	248	310	620	40	Not required
12	X05Cr17Mn4Cu2Ni5N	204Cu2	201	92	205	205	515	40	Not required
13	X05Cr17Mn6Cu2Ni4N	204Cu3	217	95	222	240	550	40	Not required
14	a) X05Cr19Mn8Ni6Mo2N	216S1*	241	100	248	415	690	40	Not required
	b) X05Cr19Mn8Ni6Mo2N	216S1**	241	100	248	345	620	40	Not required
15	a) X02Cr19Mn8Ni6Mo2N	216S2*	241	100	248	415	690	40	Not required
	b) X02Cr19Mn8Ni6Mo2N	216S2**	241	100	248	345	620	40	Not required
16	X10Cr17Ni7	301	217	95	222	205	515	40	Not required
17	X02Cr17Ni7	301 L	241	100	248	220	550	45	Not required
18	X02Cr17Ni7N	301 LN	241	100	248	240	550	45	Not required
19	X07Cr18Ni9	302	201	92	205	205	515	40	Not required
20	X04Cr19Ni9	304	201	92	205	205	515	40	Not required
21	X02Cr19Ni10	304 L	201	92	205	170	485	40	Not required
22	X07Cr19Ni9	304 H	201	92	205	205	515	40	Not required
23	X02Cr19Ni10N	304 LN	217	95	222	205	515	40	Not required
24	X04Cr19Ni9N	304 N	217	95	222	240	550	30	Not required
25	X05Cr18Ni9Si1CeN	304Ce	217	95	222	290	600	40	Not required
26	X05Cr17Ni8Cu2	304Cu	187	90	191	155	450	45	Not required
27	X05Cr18Ni9Cu2NbW	304CuW	201	92	205	205	515	40	Not required
28	X04Cr16Ni7Cu	304Mn1	178	90	182	155	450	40	Not required
29	X04Cr16Ni7MnCu	304Mn2	178	90	182	155	450	40	Not required
30	a)X05Cr19Ni9N	304N2*	241	100	248	345	620	30	Not required
	b)X05Cr19Ni9N	304N2**	241	100	248	275	585	30	Not required
31	X08Cr16Ni13Nb	304Nb	—	—	—	200	510-690	35	—
32	X06Cr18Ni12	305	183	88	187	170	485	40	Not required
33	X04Cr19Ni10Cu3Mo	305 Cu	201	92	205	205	515	40	Not required
34	X07Cr21Ni11Ce	308Ce	217	95	222	310	600	40	Not Required
35	X15Cr24Ni13	309	217	95	222	210	490	40	Not required
36	X04Cr23Ni14	309 S	217	95	222	205	515	40	Not required
37	X05Cr23Ni13	309H	217	95	222	205	515	40	Not required
38	X05Cr23Ni13Nb	309Nb	217	95	222	205	515	40	Not required
39	X07Cr23Ni13Nb	309HNb	217	95	222	205	515	40	Not required
40	X20Cr25Ni20	310	217	95	222	210	490	40	Not required
41	X04Cr25Ni20	310 S	217	95	222	205	515	40	Not required
42	X07Cr25Ni20	310H	217	95	222	205	515	40	Not required

Sl No.	**Grade Designation**		**Hardness**, *Max*			**Yield Strength,** *Min*, MPa **0.2 Percent Proof Stress**	**Tensile Strength** *Min,* MPa	**Elongation** Percent *Min* 50 mm	**Bend Test** D*ma*
	Letter Symbol [*see*IS 1762 (Part 1)]	Numerical Symbol ISS	Brinell HBS/HBW	Rockwell HRB	Vickers Load (1 to 30 kg)				
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
43	X15Cr25Ni21Si	310N	223	—	228	230	550-750	28	—
44	X05Cr25Ni20Nb	310Nb	217	95	222	205	515	40	Not required
45	X07Cr25Ni20Nb	310HNb	217	95	222	205	515	40	Not required
46	a)X01Cr25Ni21Mo2N	310MoLN (t≤6.35mm)	217	95	222	270	580	25	Not required
	b)X01Cr25Ni21Mo2N	310MoLN (t>6.35 mm)	217	95	222	255	540	25	Not required
47	a) X02Cr20Ni18Mo6CuN	312*	223	96	228	310	690	35	Not required
	b) X02Cr20Ni18Mo6CuN	312**	223	96	228	310	655	35	Not required
48	X04Cr17Ni12Mo2	316	217	95	222	205	515	40	Not required
49	X02Cr17Ni12Mo2	316 L	217	95	222	170	485	40	Not required
50	X07Cr17Ni12Mo2	316 H	217	95	222	205	515	40	Not required
51	X02Cr17Ni12Mo2N	316 LN	217	95	222	205	515	40	Not required
52	X04Cr17Ni12Mo2Ti	316 Ti	217	95	222	205	515	40	Not required
53	X05Cr17Ni12Mo2Nb	316Nb	217	95	222	205	515	30	Not required
54	X05Cr17Ni12Mo2N	316N1	217	95	222	240	550	35	Not required
55	X02Cr20Ni9Mo1N	316N2	241	100	248	310	635	35	Not required
56	X04Cr19Ni13Mo3	317	217	95	222	205	515	35	Not required
57	X02Cr19Ni13Mo3	317 L	217	95	222	205	515	40	Not required
58	X02Cr19Ni14Mo4	317LM	217	95	222	205	515	40	Not required
59	X02Cr18Ni14Mo4N	317LMN	223	96	228	240	550	40	Not required
60	X02Cr18Ni15Mo4Cu3N	317LCu	217	96	222	245	550	35	Not required
61	X02Cr19Ni12Mo3N	317LN	217	95	222	240	550	40	Not required
62	X04Cr18Ni10Ti	321	217	95	222	205	515	40	Not required
63	X07Cr18Ni10Ti	321H	217	95	222	205	515	40	Not required
64	X02Cr24Ni22Mo7N	326	250	—	255	430	750	40	Not required
65	X07Cr22Ni21Mo2Ti	334	—	—	—	205	515	40	Not required
66	X02Cr24Ni17Mo4Mn6N	345	241	100	248	415	795	35	Not required
67	X04Cr18Ni10Nb	347	201	92	205	205	515	40	Not required
68	X07Cr18Ni10Nb	347H	201	92	205	205	515	40	Not required
69	X01Cr18Ni10NbN	347LN	201	92	205	205	515	40	Not required
70	X05Cr18Ni10NbTa	348	201	92	205	205	515	40	Not required
71	X07Cr18Ni10NbTa	348H	201	92	205	205	515	40	Not required
72	X02Cr21Ni25Cu	904L	—	90	200	220	490	35	Not required
73	X01Cr20Ni25Mo6Cu	904LN	—	—	—	295	650	35	Not required
iv)	Duplex Steel								
1	X02Cr22Ni5Mo3N	1803	293	31^{A}	303	450	620	25	Not required
2	a)X02Cr21Mn3Ni2N	2011#	293	31^{A}	303	515	700	30	Not required
	b)X02Cr21Mn3Ni2N	2011##	293	31^{A}	303	450	655	30	Not required
3	a)X03Cr20Mn3Ni1N	2012#	293	31^{A}	303	500	700	35	Not required
	b)X03Cr20Mn3Ni1N	2012##	290	31^{A}	300	400	650	35	Not required
4	a)X03Cr20Ni3Mo1N	2031#	293	31^{A}	303	500	700	35	Not required
	b)X03Cr20Ni3Mo1N	2031##	290	31^{A}	300	400	650	35	Not required
5	a)X02Cr21Mn5Ni2N	2101#	290	31^{A}	300	530	700	30	Not required
	b)X02Cr21Mn5Ni2N	2101##	290	31^{A}	300	450	650	30	Not required
6	X02Cr22Ni6Mo3N	2205	293	32^{A}	303	450	655	25	Not required

Sl No.	**Grade Designation**		**Hardness**, *Max*			**Yield Strength,** *Min*, MPa **0.2 Percent Proof Stress**	**Tensile Strength** *Min,* MPa	**Elongation** Percent *Min* 50 mm	**Bend Test** D*ma*
	Letter Symbol [*see*IS 1762 (Part 1)]	Numerical Symbol ISS	Brinell HBS/HBW	Rockwell HRB	Vickers Load (1 to 30 kg)				
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
7	X02Cr23Ni4CuN	2304	290	32^A	300	400	600	25	Not required
8	a) X02Cr23Ni4MoCu	2441 (t<10 mm)	290	31^A	300	540	740	25	Not required
	b) X02Cr23Ni4MoCu	2441 (t≥10 mm)	290	31^A	300	480	680	25	Not required
9	X02Cr25Ni7Mo4CuN	2507	310	32^A	321	550	795	15	Not required
10	X02Cr25Ni7Mo3CuWN	2760	310	32^A	321	550	750	25	Not required

* - Sheet and Strip, ** - Plate, # - t ≤ 5.00 mm, ## - t > 5.00 mm, A – RC Scale, a* - thickness of the test piece.

NOTE — Tensile test not required for thickness less than 0.3mm.

(MTD 16)

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